

REMARKS

In view of the following remarks, Applicant respectfully requests reconsideration and allowance of the subject application. This amendment is believed to be fully responsive to all issues raised in the January 15, 2004 Office Action.

Rejection of claim 23 under 35 U.S.C. § 112

Claim 23 stands rejected under 35 U.S.C. § 112 as being indefinite due to lack of proper antecedent basis for the term "the reflection data." Claim 23 has been amended so that the term "the reflection data" is now "the reflection vector," which has sufficient antecedent basis. As such, Applicant respectfully requests withdrawal of the rejection of claim 23 under 35 U.S.C. § 112.

Rejections of claim 1-6, 8-13, and 15-38 under 35 U.S.C. § 103(a)

Claims 1-6, 8-13, and 15-38 stand rejected over U.S. Patent No. 6,384,824 to Morgan (hereinafter, Morgan) under 35 U.S.C. § 103(a). Applicant traverses these rejections.

To establish a prima facie case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP §2143. For the reasons set forth below, it is Applicant's position that a prima facie case of obviousness has not been established.

Claim 1 recites, in part, retrieving an environment texture sample from an environment map based on a reflection vector stored in a pixel of the reflection image. The Office equates Morgan's generated reflection vector with a reflection vector stored in a pixel of a reflection image. Morgan accesses a texel from an

1 environment map based on a generated reflection vector, which is generated on a  
2 per-pixel basis using an overloaded lighting equation. Although the Office states  
3 that multiple passes in Morgan can generate multiple reflection vectors, Morgan  
4 does not discuss loading a reflection image having pixels storing reflection  
5 vectors.

6 Consequently, Morgan fails to teach or suggest retrieving an environment  
7 texture sample from an environment map based on a reflection vector stored in a  
8 pixel of the reflection image, as recited in claim 1. Therefore, Morgan fails to  
9 teach or suggest all of the elements recited in claim 1. Accordingly, claim 1 is in  
10 condition for allowance and such allowance is respectfully requested.

11 Claims 2-6 and 8-13 each depend in some form from claim 1. Therefore,  
12 each of claims 2-6 and 8-13 includes all of the elements of claim 1. As such,  
13 Morgan fails to teach or suggest all of the elements recited in any of claims 2-6  
14 and 8-13 for the reasons given above with respect to claim 1. Claims 2-6 and 8-13  
15 are in condition for allowance and such allowance is respectfully requested.

16 Claim 15 recites retrieving a texture sample from a texture map, the texture  
17 sample containing reflection data, using the reflection data in the texture sample to  
18 obtain an environment texture sample in an environment map, and applying the  
19 environment texture sample to an object. Morgan does not discuss a texture map  
20 from which a texture sample containing reflection data is retrieved. Instead,  
21 Morgan discusses only an environment map, which is a 360 degree image of an  
22 environment as viewed from a single reference point. See Morgan col. 3, lines 21-  
23 22. The environment map of Morgan cannot be both a texture map from which a  
24 texture sample containing reflection data is retrieved and an environment map  
25 from which an environment texture sample is obtained using the reflection data.

1 Simply put, Morgan discloses only one environment map and does not disclose or  
2 suggest a texture map having a texture sample containing reflection data.

3 As a result, Morgan fails to teach or suggest retrieving a texture sample  
4 from a texture map, the texture sample containing reflection data, or using the  
5 reflection data in the texture sample to obtain an environment texture sample in an  
6 environment map as recited in claim 15. Therefore, Morgan fails to teach or  
7 suggest all of the elements recited in claim 15. Accordingly, claim 15 is in  
8 condition for allowance and such allowance is respectfully requested.

9 Claims 16-19 each depend in some form from claim 15. Therefore, each of  
10 claims 16-19 includes all of the elements of claim 15. As such, Morgan fails to  
11 teach or suggest all of the elements recited in any of claims 16-19 for the reasons  
12 given above with respect to claim 15. Claims 16-19 are in condition for allowance  
13 and such allowance is respectfully requested.

14 Claim 20, as amended, and claim 31 recite a method and computer-readable  
15 medium, respectively, for interpreting data in a pixel of a reflection image as a  
16 reflection vector, and using the reflection vector to obtain an environment texture  
17 sample in an environment map. The Office seemingly equates Morgan's  
18 generating a reflection vector with interpreting data in a pixel or one of a reflection  
19 image or a texture map as a reflection vector. However, Morgan's generating  
20 operation involves calculating a reflection vector on a per-pixel basis and does not  
21 involve interpreting stored pixel data as a reflection vector. As discussed above  
22 with respect to claims 1 and 15, Morgan does not disclose a reflection image or a  
23 texture map having reflection vectors. In addition, Morgan does not disclose a  
24 pixel having data that is interpreted as a reflection vector.

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1 Morgan fails to teach or suggest interpreting data in a pixel of a reflection  
2 image or a texture map as a reflection vector as recited in claims 20 and 31.  
3 Therefore, Morgan fails to teach or suggest all of the elements recited in either of  
4 claim 20 or 31. Accordingly, claims 20 and 31 are in condition for allowance and  
5 such allowance is respectfully requested.

6 Claims 21-24 each depend in some form from claim 20. Therefore, each of  
7 claims 21-24 includes all of the elements of claim 20. As such, Morgan fails to  
8 teach or suggest all of the elements recited in any of claims 21-24 for the reasons  
9 given above with respect to claim 20. Claims 21-24 are in condition for allowance  
10 and such allowance is respectfully requested.

11 Claims 32-33 each depend in some form from claim 31. Therefore, each of  
12 claims 32-33 includes all of the elements of claim 31. As such, Morgan fails to  
13 teach or suggest all of the elements recited in any of claims 32-33 for the reasons  
14 given above with respect to claim 31. Claims 32-33 are in condition for allowance  
15 and such allowance is respectfully requested.

16 Claim 25 recites, in part, retrieving a texture sample from a texture map,  
17 and using the texture sample to retrieve an environment texture sample from an  
18 environment map. As discussed above, Morgan's generating a reflection vector  
19 on a per-pixel basis does not correspond to retrieving a texture sample from a  
20 texture map that can be used to retrieve an environment texture sample from an  
21 environment map.

22 Morgan fails to teach or suggest retrieving a texture sample from a texture  
23 map, as recited in claim 25. As such, Morgan fails to teach all of the elements  
24 recited in claim 25. Accordingly, claim 25 is in condition for allowance and such  
25 allowance is respectfully requested.

1       Claim 26 recites, in part, a texture map comprising reflection data, and an  
2 environment map. The Office states that an environment texture map is  
3 considered a texture map, apparently suggesting that Morgan's environment  
4 texture map corresponds to the texture map of claim 26. Morgan teaches an  
5 environment map but does not teach or suggest a texture map comprising  
6 reflection data. Rather than teaching a texture map comprising reflection data,  
7 Morgan teaches an overloaded lighting equation for calculating a reflection vector  
8 on a per-pixel basis.

9       The Office cites Morgan at col. 9, lines 31-35, which are reproduced below:

10      “Additional passes can be used to combine the resulting image  
11 with further underlying geometry. A final image representative of  
12 the geometry data bump mapped into an environment map is then  
13 output for display on display unit 660.”

14      However, the above portion of Morgan does not teach or suggest performing  
15 additional passes to create a texture map comprising reflection data. Rather, the  
16 above portion of Morgan refers to repeatedly storing Morgan's environment map  
17 texels. In addition, Morgan's environment map cannot serve as both an  
18 environment map and a texture map comprising reflection data. For the foregoing  
19 reasons alone, Morgan fails to teach or disclose all of the elements recited in claim  
20 26.

21      Furthermore, claim 26 recites, in part, a texture map sampling procedure to  
22 obtain a first texture sample from the texture map, and an environment map  
23 sampling procedure to obtain a second texture sample from the environment map  
24 based on the first texture sample. Fig. 4 of Morgan was cited by the Office. Block  
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1 430 in Fig. 4 of Morgan is the only block where a texture sample is accessed.  
2 However, only one map, the environment map, in Morgan is accessed. Morgan  
3 neither teaches nor suggests a texture sampling procedure for obtaining a first  
4 texture sample from a texture map.

5 Morgan fails to teach or suggest at least one of the elements recited in claim  
6 26. As such, Morgan fails to teach or suggest all of the elements recited in claim  
7 26. Claim 26 is in condition for allowance and such allowance is respectfully  
8 requested.

9 Claim 34 recites, in part, an application program having computer program  
10 logic, an environment map, and a texture map comprising reflection data and a  
11 graphics subsystem for rendering an object using the texture map and the  
12 environmental map. As discussed above with respect to claim 26, Morgan fails to  
13 teach or suggest both a texture map comprising reflection data and an environment  
14 map. For at least the foregoing reasons, Morgan fails to teach or suggest all of the  
15 claim elements recited in claim 34. Claim 34 is in condition for allowance and  
16 such allowance is respectfully requested.

17 Claims 35-38 each depend in some form from claim 34. Therefore, each of  
18 claims 35-38 includes all of the elements of claim 34. As such, Morgan fails to  
19 teach or suggest all of the elements recited in any of claims 35-38 for the reasons  
20 given above with respect to claim 34. Claims 35-38 are in condition for allowance  
21 and such allowance is respectfully requested.

22 Furthermore, the Office has rejected claims 6, 8-10, 15, 17, 19, 20, 22, 24,  
23 25, 33, and 36-38 by stating that these claims are similar to claim 1, and therefore  
24 they are rejected under the same rational. Although there may be some overlap  
25 between the features of claims 6, 8-10, 15, 17, 19, 20, 22, 24, 25, 33, 36-38 and

1 claim 1, the claims are not identical. Rather, the Applicant has claimed a number  
2 of features as an attempt to conform to the Office's preferred practice of  
3 submitting claims having a range of breadth. The Applicant has submitted extra  
4 fees for the inclusion and examination of these claims. In response to this effort, it  
5 is the Office's responsibility to fully examine each of these claims, and to give full  
6 consideration to each of the limitations of these claims with grounds of rejection  
7 for each limitation of each claim. See, e.g., MPEP 706.02(j).

8 In addition, the Office has made allegations as to certain well-known art in  
9 support of various rejections. For example, regarding claim 36, the Office notes  
10 that "...an environment texture sample is considered a texture sample and that an  
11 environment map, from which an environment texture sample is retrieved, is  
12 considered the same as a texture map, from which a texture sample is retrieved."  
13 The Office makes similar allegations in the Office's rejections of claims 1, 5, 8,  
14 11, 13, 31, and 34.

15 The Applicant hereby seasonably traverse the Office's allegations of well-  
16 known art regarding claims 1, 5, 8, 11, 13, 31, 34, and 36 and kindly requests that  
17 the Office provide a reference in support of each of the allegations, or to otherwise  
18 withdraw the rejections. If the applicant traverses such an assertion, the examiner  
19 should cite a reference in support of his or her position. MPEP 2144.03. If the  
20 Office is basing the allegations on the Examiner's personal knowledge, the  
21 Applicant hereby kindly calls upon the Examiner to set forth the facts in an  
22 Examiner's affidavit or to otherwise withdraw the rejections. When a rejection is  
23 based on facts within the personal knowledge of the examiner, the data should be  
24 stated as specifically as possible, and the facts must be supported, when called for

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1 by the applicant, by an affidavit from the examiner. MPEP 2144.03; 37 CFR  
2 1.104(d)(2).

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4 **Rejection of claim 7 under 35 U.S.C. § 103(a)**

5 Claim 7 stands rejected over Morgan, in view of U.S. Patent No. 6,297,833  
6 to Ho (hereinafter Ho), under 35 U.S.C. § 103(a). Applicant traverses this  
7 rejection.

8 Claim 7 depends from claim 1. Therefore, claim 7 includes all of the  
9 elements of claim 1. As such, Morgan and Ho, separately and in combination, fail  
10 to teach or suggest all of the elements recited in claim 7 for the reasons given  
11 above with respect to claim 1. For the foregoing reasons alone, claim 7 is  
12 allowable and such allowance is respectfully requested.

13 To establish a prima facie case of obviousness, there must be some  
14 suggestion or motivation, either in the references themselves or in the knowledge  
15 generally available to one of ordinary skill in the art, to modify the reference or to  
16 combine reference teachings and there must be a reasonable expectation of  
17 success. See MPEP §2143. In addition, the teaching or suggestion to make the  
18 claimed combination and the reasonable expectation of success must both be  
19 found in the prior art, not in Applicant's disclosure. See id.

20 As discussed above, Morgan does not discuss retrieving an environment  
21 texture sample from an environment map based on a reflection vector stored in a  
22 pixel of the reflection image, which is recited in claims 1 and 7. Rather, Morgan  
23 discusses accessing a texel in an environment map based on a reflection vector  
24 generated on a per-pixel basis. Ho discusses a technique for bump mapping. As  
25 discussed in Ho, two texture stages 29a and 29b generate texture values from a

1       single texture map (i.e., bump map). See Ho, col. 7, lines 5-9. Ho does not  
2 discuss a reflection image having a pixel that stores reflection vectors.

3       As an additional matter, to provide a missing feature of claim 7 the office  
4 seemingly relies on personal knowledge without pointing to any specific teaching  
5 or suggestion. Specifically, after admitting that Morgan does not teach or suggest  
6 loading, retrieving, and applying performed during a single pass through the  
7 graphics pipeline but that for multiple pixels, Morgan would require multiple  
8 passes through the graphics pipeline, the office asserts that the skilled artisan is not  
9 bound by the teaching and suggestions of the references of record. The office  
10 concludes by asserting that the recited features of claim 7 could have been  
11 achieved because “a requirement for supporting multiple passes” of Morgan “is  
12 not necessary and as such requires less complexity of the system design” of Ho.

13      Since Morgan requires a multi-pass system for multiple pixels, and Ho does  
14 not teach or suggest a multi-pass system, the office is apparently relying on  
15 personal knowledge to make this modification to Morgan. Thus, the modification  
16 urged by the Office would likely make Morgan’s algorithm, which depends on  
17 multiple passes, inoperable.

18      When a rejection in an application is based on facts within the personal  
19 knowledge of an employee of the office, the data shall be as specific as possible,  
20 and the reference must be supported, when called for by the applicant, by the  
21 affidavit of such employee, and such affidavit shall be subject to contradiction or  
22 explanation by the affidavits of the applicant and other persons. 37 CFR  
23 §1.104(d)(2). If this rejection is maintained on a similar basis in a subsequent  
24 action, the applicant respectfully requests the Examiner to supply such an affidavit  
25 to support this modification to Morgan.

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2 **Rejection of claim 14 under 35 U.S.C. § 103(a)**

3 Claim 14 stands rejected over Morgan, in view of U.S. Patent No.  
4 5,704,024 to Voorhies (hereinafter Voorhies), under 35 U.S.C. § 103(a).  
5 Applicant traverses this rejection.

6 Claim 14 depends from claim 1. Therefore, claim 14 includes all of the  
7 elements of claim 1. Claim 1, and hence, claim 14, recite, in part, retrieving an  
8 environment texture sample from an environment map based on a reflection vector  
9 stored in a pixel of the reflection image. As discussed above with respect to claim  
10 1, Morgan fails to teach or suggest a reflection vector stored in a pixel of a  
11 reflection image. Voorhies also fails to teach or suggest a reflection vector stored  
12 in a pixel of a reflection image.

13 Morgan and Voorhies, separately and in combination, fail to teach or  
14 suggest retrieving an environment texture sample from an environment map based  
15 on a reflection vector stored in a pixel of the reflection image as is recited in claim  
16 14. As such, Morgan and Voorhies, separately and in combination, fail to teach or  
17 suggest all of the elements recited in claim 14 for the reasons given above. Claim  
18 14 is in condition for allowance and such allowance is respectfully requested.

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21 **Conclusion**

22 Claims 1 – 38 are in condition for allowance. Applicant respectfully  
23 requests reconsideration and prompt issuance of the present application. Should  
24 any issue remain that prevents immediate issuance of the application, the  
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1 Examiner is encouraged to contact the undersigned attorney to discuss the  
2 unresolved issue.

3  
4 Respectfully Submitted,

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6 Dated: 3/31/04

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